MICHIGAN STATE UNIVERSITY

Project Plan Presentation

QA Audit Center

The Capstone Experience

Team United Airlines Quality Assurance

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From Students…
…to Professionals

Functional Specifications

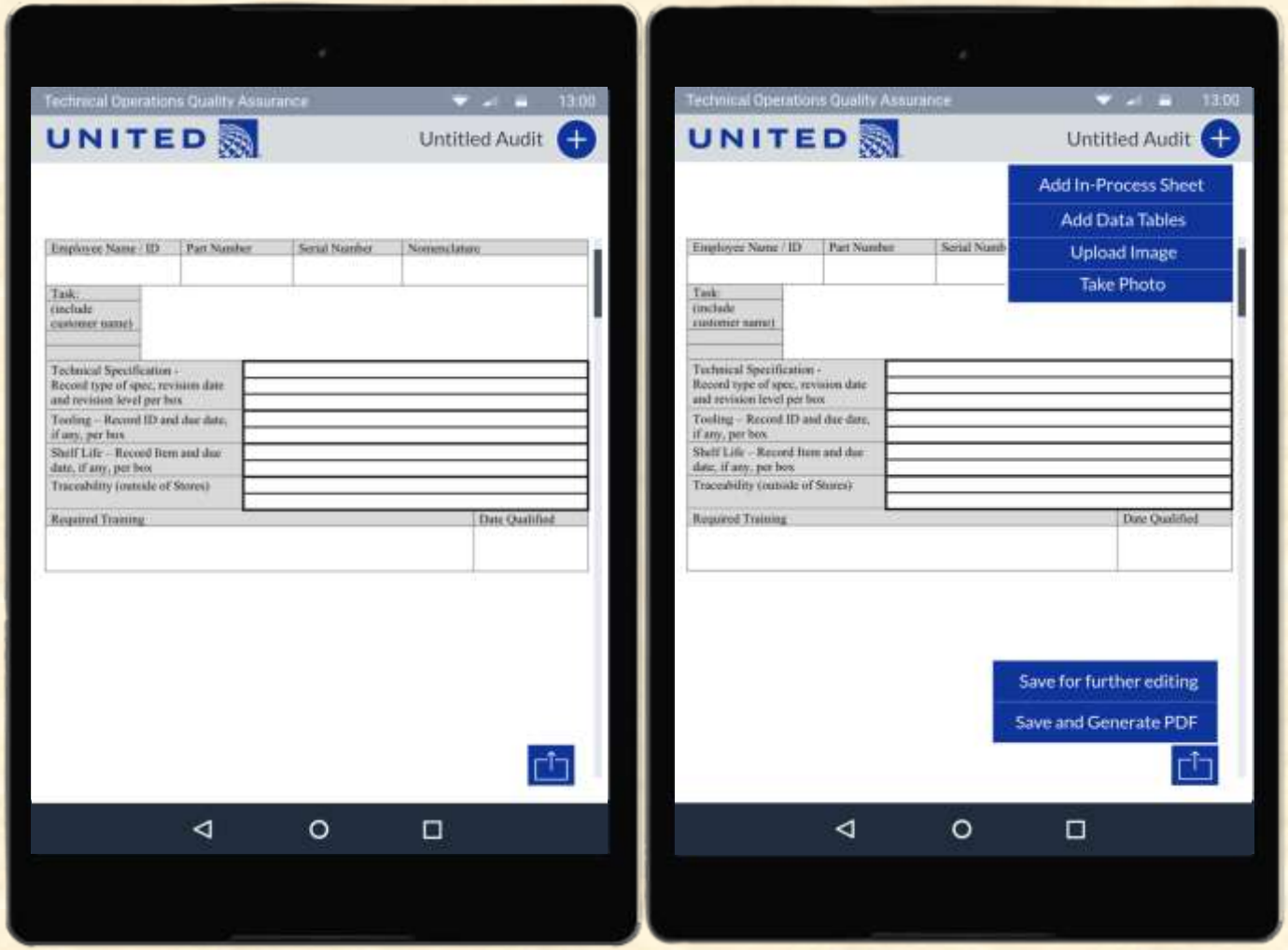
- Auditors will be able to maintain optimal business operations by conducting audit reports and completing checklists on the app offline
  - Application will allow auditors to be more vigilant in the audit process, minimize the risk for errors, and make reports easily accessible
- Allow off-wing quality assurance auditors to be up to date on the Federal Aviation Association (FAA) regulations and policies

Design Specifications

- Android mobile application consists of two main views: the initial dashboard and the audit sheet:
  - Within the audit sheets, there are two kinds of data entries:
    - In-process sheet
    - Tabular data that serve to further capture details such as:
      - Technical data
      - Records of maintenance
      - Calibration
      - Training
      - Traceability
      - Shelf life
- The main dashboard will populate and allow auditors to generate a new audit sheet, search for an existing audit sheet in the database, or check for notifications from the server about any updates on the Airworthiness Directives from the FAA site.
- When the user selects the option to create an audit sheet, the activity will start with a view with six In-Process sheets, with the option to populate more if needed, and they will be able to navigate to another view to fill out the other six tables' data sets.
- They also can take photos for evidence and include them alongside the Audit Sheet
- Due to the circumstance of auditors having no service out in the field, the PDFs will be stored locally until they are online.
- Once an internet connection is established, the user will have the option to edit an existing document.
  - This will allow the auditor to go back and make any needed changes before they submit it for evaluation.

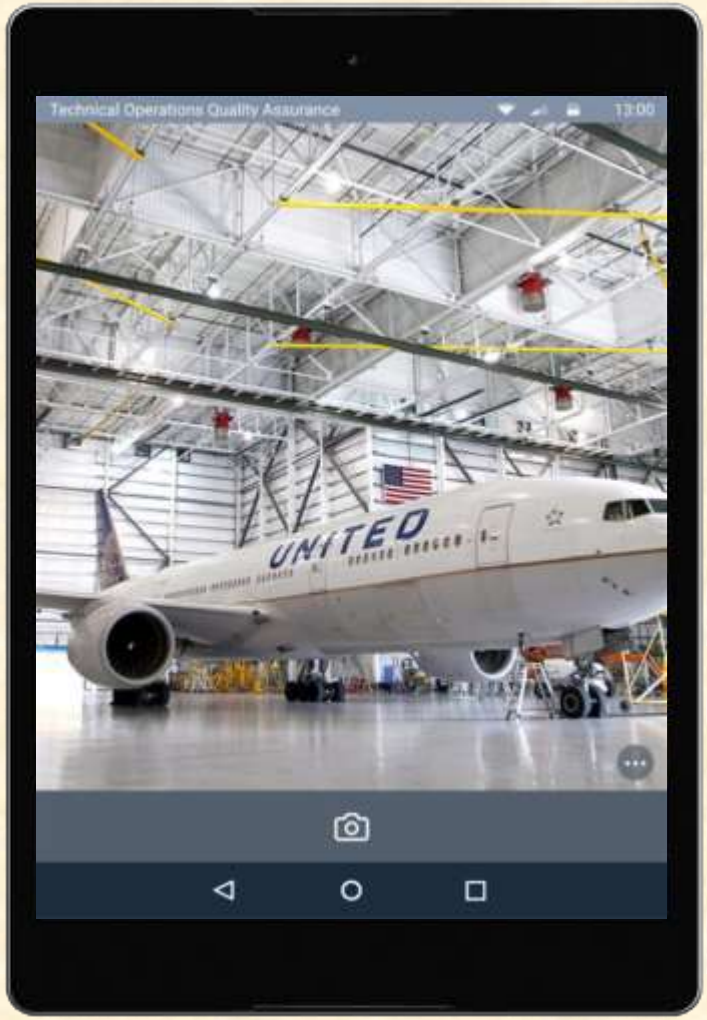
Screen Mockup: Dashboard

Screen Mockup: In Process Sheet



Screen Mockup: Tabular Data

Screen Mockup: Capture Imaging



Technical Specifications

- Application will use Android SDK libraries to generate PDFs from the Audit Logs.
- Audit logs will be saved to the SQLite database as PDF documents.
- The schema will be a simple relational model.
  - Documents can be retrieved from the database by joining tables for auditors and documents.
- Application will conduct web-scraping at regular intervals on the FAA site using PHP's Guzzle library.
- Airworthiness Directives collected from the web-scraper will be sent to the application as a link in the dashboard.

System Architecture

System Components

- Hardware Platforms
  - Android Mobile Device
  - MSU Server
- Software Platforms / Technologies
  - Android Studio
  - Android Studio SDK
  - SQLite
  - PhpStorm
  - Guzzle

Risks

- **Credentials for PhpStorm on Server**
  - The server now has an internet connection. PhpStorm has been installed and needs the SQLite plugin. We need the right credentials before we can access the database or run PHP code on the server.
  - All that is left to solve is getting a PHP application running on the server and importing SQLite. This can be solved by reviewing resources on setting up credentials for Php Storm.
- **Web Scraping Government Websites**
  - Application needs to regularly scrape FAA site and notify the auditor to any updated Airworthiness Directive documents.
  - The PHP library Guzzle will allow for the back-end to web-crawl through the FAA site and pull out any updated information from the Regulations page.
- **Generate PDF from In-Process Sheet Data**
  - Application needs to take audit data and convert it into a PDF. PDF should look just like a physical Audit Sheet document, with several In-Process Sheets with several tables.
  - A solution would be to use Android Studio's built in PDF library. The library will allow PDFs to be generated from scratch. The data auditors place in the app will be used to fill the forms on the PDF.
- **Allow Auditors to Edit an Existing Audit Log PDF**
  - Auditors should be able to edit existing logs within the app. Submitting the edits will rewrite the PDF document in the database.
  - Create a JSON object that will represent the Audit Form. Allocate a table in the SQLite database that will be joined with the document table. Auditors who want to change a document can access and update the JSON object table and rewrite the PDF.
- **Decipher Text from Images Taken on the Mobile App**
  - An additional feature would be to extract textual data from images taken from the app. This feature will allow auditors to take photos from documents and have the text be extracted from those documents.
  - We can use the Java library Tess4J along with our sponsor's approval. It abstracts the process of optical character recognition.

Questions?